

Claims:

1. Process for the manufacture of doped silica bodies comprising:

- (a) preparing a porous body of silica particles, the porous body having a first porous region that is up-doped and a second porous shell region comprising a lower doped or undoped portion,
- (b) heating the porous body to a temperature of at least 1100 °C in the absence of fluorine for a period sufficient to selectively consolidate the first porous region,
- (c) heating the porous body in a fluorine atmosphere to dope the silica particles in the second porous region, and
- (d) heating the porous silica body at a temperature greater than 1300 °C to consolidate the porous silica body.

2. Process for the manufacture of optical fibers comprising:

- (a) preparing an optical fiber preform,
- (b) heating the preform to the softening temperature, and
- (c) drawing an optical fiber from the preform

the invention characterized in that the optical fiber preform is produced by:

- (i) preparing a porous body of silica particles, the porous body having a first porous region that is up-doped and a second porous shell region comprising a lower doped or undoped portion,

- 9 (ii) heating the porous body to a temperature of at least 1150 °C
10 in the absence of fluorine for a period sufficient to selectively
11 consolidate the first porous region,
12 (iii) heating the porous body in a fluorine atmosphere to dope the
13 silica particles in the second porous shell region, and
14 (iv) heating the porous silica body at a temperature greater than
15 1300 °C to consolidate the porous silica body.

1 3. Process for the manufacture of optical fibers comprising:

- 2 (a) preparing an optical fiber preform,
3 (b) heating the preform to the softening temperature, and
4 (c) drawing an optical fiber from the preform

5 the invention characterized in that the optical fiber preform is produced by:

- 6 (i) preparing a porous silica core rod of silica particles, the core
7 rod having an inner up-doped region surrounded by an outer shell
8 region, said outer shell region comprising a lower doped region,
9 (ii) heating the porous silica core rod to a temperature of at least
10 1100 °C in the absence of fluorine for a period sufficient to
11 selectively consolidate the inner up-doped region,
12 (iii) cooling the porous silica core rod
13 (iv) introducing a fluorine-containing atmosphere with a first
14 fluorine concentration to deposit fluorine on the silica particles in
15 the lower doped region,

- 16 (v) reducing the fluorine concentration, and
 17 (vi) heating the porous silica body at a temperature greater than
 18 1300 °C, to consolidate the porous silica core rod.

1 4. The process of claim 3 wherein the fluorine atmosphere comprises SiF₄.

1 5. The process of claim 4 wherein the fluorine atmosphere is greater than 10%
 2 SiF₄ .

1 6. The process of claim 3 wherein the outer shell region is undoped silica.

1 7. The process of claim 3 wherein the inner core region is doped with
 2 germania.

1 8. The process of claim 7 wherein the inner core region is doped to a Δn in the
 2 range 0.001-0.058..

1 9. The process of claim 3 wherein the temperature used in step (iii) is in the
 2 range 500 - 1100 °C.